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UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY

FOREST INSECT INVESTIGATIONS

REPORT ON

DENDROCTONUS PONDEROSAE ATTACKS OF 1924

By

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Specialist in Scolytidae,
U.S. Bureau of Entomology

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January 12, 1927

GOVERNMENT PRINTING OFFICE

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The following counts of attack were made on trees killed in 1924 and treated in the spring of 1925. The majority of the trees treated that year were burned so it was a difficult matter to find 1924 trees in suitable condition for the counts and it was entirely impossible to find the desired number in each diameter class. Most of the trees were small and in the smaller diameter classes there were an ample number available, but this was not true of the larger trees.

As the trees counted were all peeled it was not practical to take their DBH so that the data was recorded for stump diameters instead. The data above the stump was taken in terms of circumference at base and top of area counted. This allowed direct computation of the area (inside bark) counted. In making computations of areas by 10 ft. logs, each tree was treated as a cone and the area was carefully computed to the first decimal. The trees are sorted as to diameter and totals and averages are given in the tabulated data for each diameter class except for the few trees of diameter greater than 30 inches. These are totaled together.

When summarized by 10 ft logs, the data works out as follows:

	Total area i.e.-sq. ft.		Total Attacks		Attack per sq. ft.
First 10 ft. log . .	5250.4	-	20,352	-	3.87
Second " " " . .	4762.4	-	25,333	-	5.32 -
Third " " " . .	3656.0	-	19,058	-	5.21
Fourth " " " . .	1829.3	-	9,634	-	5.26
Fifth " " " . .	704.7	-	3,328	-	4.72
Sixth " " " . .	150.1	-	684	-	4.55
Seventh" " " . .	40.5	-	166	-	4.13 -
Eighth " " " . .	18.3	-	80	-	4.37
Entire Trees . .	16,234.	-	78,753.	-	4.850

It will be interesting to compare this data with the counts of attacks of other years. The counts of years previous to 1924 are in your files but are not available to me at present. However, we have a few counts of the 1925 attacks made in connection with other work and not taken by 10 ft. logs which serve as a basis of general comparison with the totals of 1924. This data is given and totaled below:

	Sq. ft. Counted		Total Attacks		Attacks per sq.ft.
Entire standing Trees -	1522.5	-	8353	-	5.39
Souring experiments -	2289.	-	10028	-	4.28
Covered logs -	1130	-	5997	-	5.307
Samples Trees -	794	-	4371	-	5.505
Totals for all 1925 Trees -	5685.5	-	29049	-	5.11

DENDROCTONUS PONDEROSAE ATTACKS - 1924
KAIBAB NATIONAL FOREST

(Counts made August 1926 on the Trees in Jacobs Lake Area treated in 1925)

Stump diameter or DBH	Total height	Total infested length	Length Counted	Circumference Inside Bark Base	Circumference Inside Bark Top	Circumference Outside Bark Top of last log	Area and Attacks by 10 ft. logs. First Area	First Attacks	Second Area	Second Attacks	Third Area	Third Attacks	Fourth Area	Fourth Attacks	Fifth Area	Fifth Attacks	Sixth Area	Sixth Attacks	Seventh Area	Seventh Attacks	Eighth Area	Eighth Attacks	Total Area: Counted Sq.Ft.	Total Attacks	Attacks per Sq. Ft.
9	45	20	20	21	17	19	16.6	104	15.0	78													31.6	182	5.76
						Average	6.26		5.20																
11	50	20	20	27	24	27	22.0	66	21.0	66													43.3	132	3.05
10	50	25	20	26	20	23	20.4	64	17.9	72													38.4	136	3.54
11	40	20	20	24	17	19	18.5	100	15.6	72													34.2	172	5.03
10	25	15	10	20	17	19	15.4	56															15.4	56	3.61+
11	40	14	10	21	19	25	16.8	58															16.8	58	3.45+
11	60	30	30	24	19	22	19.3	72	17.9	78	16.5	64											53.7	214	3.97-
10	60	35	30	24	18	21	19.2	84	17.5	82	15.8	100											52.5	266	5.07+
10	55	14	10	25	20	25	18.7	84															18.7	84	4.49+
10	40	25	20	19	14	17	14.8	70	12.7	52													27.5	122	4.44-
10	45	16	10	21	20	24	17.0	92															17.0	92	5.41+
11	45	25	20	24	23	27	19.8	96	19.0	88													37.4	184	4.92-
11	70	30	30	25	18	21	19.8	88	17.9	52	15.1	58											53.7	198	3.69-
10	45	20	20	25	16	19	18.5	58	16.2	78													34.2	136	3.98-
11	55	25	20	27	24	27	21.9	72	20.6	108													42.4	180	4.24+
				Totals			260.1	1060	176.3	748	47.4	222											479.2	2030	
				Averages			4.07+		424+		4.68														4.23+
12	60	40	40	31	17	20	24.4	100	21.4	108	18.5	96	15.6	98									80.0	402	5.02
12	55	35	30	29	24	27	23.5	100	22.1	104	20.7	78											66.3	282	4.24
12	55	15	10	31	28	31	24.7	118															24.7	118	4.77
12	55	35	30	31	19	22	24.2	118	20.8	76	17.5	58											62.4	252	4.04
12	65	30	30	29	24	27	23.5	156	22.1	124	20.7	92											66.3	372	5.61
12	40	16	10	25	24	28	20.4	64															20.4	64	3.13+
12	60	34	30	28	21	25	22.6	114	20.4	116	18.5	98											61.2	328	5.36-
12	45	25	20	23	20	25	18.5	94	17.2	96													35.8	190	5.31-
12	45	25	20	28	24	27	22.5	56	20.8	82													43.4	138	3.18-
12	75	20	20	26	25	28	21.5	78	21.0	100													42.4	178	4.19+
				Totals			225.8	998	165.8	806	95.9	422											502.9	232.4	
				Averages			4.42-		4.86+		4.40														4.62
13	40	20	20	30	22	26	23.3	156	20.0	157													433	313	7.23
13	65	20	20	34	31	34	27.7	132	265	82													54.2	214	3.95
13	65	35	30	30	25	28	24.3	70	229	84	215	66											68.7	220	3.20+
13	40	10	10	28	27	30	22.9	68															22.9	68	2.96
13	65	35	30	30	25	28	24.3	134	22.9	132	21.5	146											68.7	412	5.99-
13	40	30	30	30	17	19	23.2	114	19.6	112	15.9	66											58.8	292	4.96+
13	50	25	20	28	25	29	22.7	66	21.5	110													44.2	176	3.98+
13	45	25	20	30	26	29	24.2	108	22.4	92													46.6	200	4.29+
13	55	20	20	31	28	31	25.2	144	23.0	144													48.2	288	5.97+
13	70	30	30	31	24	28	24.9	86	22.8	188	21.0	74											68.7	278	4.04+
13	70	35	30	28	21	25	22.4	80	20.4	108	18.5	72											61.2	260	4.25-
13	60	38	30	31	21	25	24.4	130	21.7	88	18.9	78											65.1	296	4.55-
13	65	25	20	29	21	26	22.5	92	19.1	144													41.6	236	5.67+
13	55	30	30	30	23	27	24.0	94	22.1	100	20.1	62											66.3	256	3.86+
				Totals			336.0	1474	284.9	1471	137.4	564											760.5	3509	
				Average			4.38+		5.16+		4.10+														4.61+
14	60	35	30	34	27	30	27.3	65.3	25.4	104	23.5	178											75.2	348	4.56
14	75	35	30	35	27	30	28.0	88	25.8	96	23.6	72											77.4	256	3.31
14	55	25	20	34	29	31	27.3	84	25.2	78													52.4	162	3.09
14	50	35	30	32	23	26	25.4	144	22.9	188	20.4	160											68.7	492	7.16
14	70	30	30	30	25	29	24.3	154	22.8	116	21.5	84											68.7	354	5.15+
14	65	40	40	36	20	23	28.3	160	25.0	154	21.7	158	18.3	114									93.2	586	6.29-
14	50	20	20	33	23	27	26.2	100	20.4	52													46.6	152	3.27-
14	65	30	30	32	26	29	25.8	144	24.2	184	22.5	174											72.9	502	6.88+
14	50	30	30	30	16	20	23.0	120	19.2	134	15.3	70											57.6	324	5.62+
14	55	30	30	30	20	24	23.6	142	20.8	122	18.0	106											62.4	370	5.93-
14	55	30	30	36	24	28	28.3	114	25.0	104	21.7	62											75.0	280	3.73+
14	75	35	30	33	27	30	26.6	114	25.0	128	19.2	116											75.0	358	4.77+
14	85	40	40	38	27	30	30.5	108	28.2	132	25.9	114	23.6	62									108.4	412	3.89+
				Totals			345.2	1538	309.9	1592	233.3	1294	41.9	176									934.5	4596	
				Average			4.45+		5.13+		5.54+		4.20+												4.91+
15	65	15	10	36	33	36	28.7	60															28.7	66	2.3
15	65	40	40	39	24	2263	30.9	136	27.8	138	24.6	132	21.5	106									103.2	512	4.96
15	40	20	20	33	22	25	25.2	144	20.6	62													45.8	206	4.49
15	55	35	30	38	23	26	29.6	168	25.4	156	21.2	176											76.2	500	6.56
15	65	35	30	37	28	32	29.6	130	27.1	226	24.6	216											81.3	572	7.04
15	40	25	20	35	20	23	26.0	84	19.8	80													45.8	164	3.58+
15	70	40	40	35	20	24	27.6	160	24.5	134	213	124	18.2	44									91.6	462	5.04+
15	85	45	40	40	31	31	32.4	72	30.5	152	28.6	132	26.8	132									118.4	488	4.12+
15	60	35	30	37	27	32	29.4	120	26.6	116	23.9	82											80.1	318	3.97
15	95	35	30	37	31	33	30.0	84	28.3	186	26.6	128	1										84.9	398	4.69-
				Totals			289.4	1164	232.6	1250	175.8	990	66.5	282									666.0	3686	
				Averages			4.02+		5.41+		5.63+		4.25												5.53
16	70	40	40	40	27	30	31.9	164	29.3	196	26.6	146	23.8	122									118.8	628	5.29
16	70	35	30	43	36	39	34.9	160	32.9	160	30.9	148											98.7	468	4.76
16	65	35	30	41	30	33	32.9	150	30.4	222	28.0	172											88.8	544	6.13
16	55	30	30	40	26	30	31.4	82	27.5	148	236	100											82.5	330	4.00
16	70	32	30	40	30	35	31.9	110	29.2	154	26.4	144											87.6	408	4.77+
16	70	45	40	41	26	31	32.6	130	29.5	202	26.3	164	23.2	128									111.6	624	5.59+
16	60	30	30	42	29	32	33.2	164	29.6	156	25.9	116											88.7	436	4.91+
~~16~~	~~60~~	~~30~~	~~30~~	Totals			228.8	960	208.4	1238	187.7	990	47.0	250									676.7	3438	5.08
				Average			4.19+		5.94+		5.27-		5.32												5.08
17	75	25	20	40	33	39	31.9	116	28.9	128													60.8	244	4.01-
17	75	26	20	48	42	46	38.8	196	36.2	210													75.0	406	5.41
17	85	50	50	36	27	30	29.3	156	27.7	150	26.3	120	24.8	122	23.2	78							131.0	626	4.78
17	80	40	40	39	26	29	31.1	182	28.4	192	25.7	92	23.0	76									108.4	542	5.00
17	60	35	30	41	28	33	32.4	150	28.8	150	25.1	124											86.1	424	4.92
17	65	35	30	42	34	38	33.9	146	31.7	174	29.4	148											94.8	468	4.93+
17	55	25	20	38	33	37	30.6	154	28.6	118													59.2	272	4.59+
17	75	45	40	37	25	28	29.6	166	27.1	162	24.6	132	2.21	126									103.2	536	5.68-
17	60	35	30	45	28	31	35.1	248	30.4	194	25.7	104											91.2	546	5.98+
17	60	38	30	40	28	30	31.7	170	28.3	184	25.0	122											84.9	476	561-
17	65	35	30	46	27	40	37.1	202	34.6	222	32.1	144											103.8	568	5.47+
				Totals			361.5	1886	330.7	1884	213.9	986	69.9	324	23.2	78							998.4	5158	
				Averages			5.22-		5.69+		4.61		4.63+		3.41-										5.166

DENDROCTONUS PONDEROSAE ATTACKS - 1924 - Continued
KAIBAB NATIONAL FOREST

(Counts made August 1926 on the Trees in Jacobs Lake Area treated in 1925)

Stump Diameter or DBH	Total height	Total infested length	Length Counted	Circumference Inside Bark Base	Circumference Inside Bark Top	Circumference Outside Bark Top of last log	Area and Attacks by 10 ft. logs. First Area	First Attacks	Second Area	Second Attacks	Third Area	Third Attacks	Fourth Area	Fourth Attacks	Fifth Area	Fifth Attacks	Sixth Area	Sixth Attacks	Seventh Area	Seventh Attacks	Eighth Area	Eighth Attacks	Total Area Counted Sq. Ft.	Attacks	Attacks per Sq. Ft.
18	85	30	30	45	38	42	36.5	144	34.6	164	32.6	104											104.1	412	3.96
18	80	45	40	49	35	41	39.4	148	36.4	204	33.5	172	30.6	122									140.0	646	4.61
18	75	50	50	42	24	27	33.5	142	30.5	162	27.5	152	24.5	124	21.5	94							137.5	674	4.9
18	65	20	20	41	36:2	40	33.1	152	31.0	156													64.2	308	4.79+
18	70	35	30	41	32	37	35.4	174	30.4	182	27.9	160											91.2	516	5.66
18	80	40	40	43	30	36	34.5	162	31.8	236	29.1	182	26.3	92									121.6	672	553 -
18	80	42	40	48	31	37	33.8	128	31.5	202	29.3	158	26.9	182									121.6	670	5.51-
18	80	42	40	43	28	32	34.3	148	31.7	240	28.0	202	24.9	122									118.4	712	6.01+
18	85	40	40	46	30	39	36.7	104	33.3	258	30.0	274	26.7	212									126.4	848	6.71-
18	80	30	30	44	35	40	35.4	116	32.9	162	30.4	144											98.7	422	4.27+
18	88	40	40	42	30	35	34.7	140	32.1	200	29.6	132	27.1	124									120.0	596	4.97-
18	75	30	30	53	35	40	41.7	170	36.7	232	31.6	166											110.0	568	5.16
				Totals			429.0	1728	392.4	2398	329.5	1846	187.0	978	21.5	94							1357.7	7044	
				Averages			4.03-		6.11+		5.60+		5.23		4.37										5.188
19	75	45	40	49	33	47	39.2	178	35.8	212	32.5	188											136.8	724	5.29
19	60	45	40	44	28	33	35.0	162	31.7	126	28.3	128											103.2	516	5.00
19	65	35	30	41	28	35	32.4	166	28.7	198	25.1	164											86.1	528	6.13 +
19	70	30	30	48	36	41	38.2?	86	35.0	142	31.7	126											105.0	354	3.37 +
19	65	45	40	38	23	27	30.1	174	27.0	156	23.9	160											101.6	602	5.92 +
19	70	40	40	39	25	29	31.0	142	28.1	110	25.2	192											106.8	540	5.05+
19	75	48	40	52	37	42	41.8	160	38.6	212	35.5	192											148.4	740	4.98 +
19	7	45	40	44	36	40	35.8	148	34.2	242	32.6	228											133.3	796	5.98 -
19	75	25	20	48	39	44	38.1	154	34.4	226													72.5	380	5.24 +
19	60	30	30	50	36	39	38.8	124	35.8	98	32.0	96											107.4	318	2.96 +
19	65	20	20	47	38	42	37.3	148	33.5	174													70.8	322	4.55-
				Totals			397.8	1642	362.8	1896	266.8	1474											1171.9	5820	
				Averages			4.13-		5.31+		5.52+														4.96
21	70	50	50	54	27	31	42.7	74	38.2	112	33.7	128	29.2	230	24.7	124							168.5	668	3.96
21	75	40	40	51	39	42	40.4	160	37.9	204	35.4	170	32.9	154									150.0	688	4.59
21	75	45	40	43	34	41	41.2	272	38.8	228	36.3	174	33.8	110									128.4	784	6.02+
20	75	50	50	50	28	33	39.8	130	36.1	186	32.4	174	28.7	164	25.0	96							162.5	750	4.61-
21	65	50	50	48	23	27	37.9	192	33.7	230	29.5	154	25.3	152	21.1	102							148.0	830	5.61+
21	70	30	30	44	36	40	35.5	184	33.3	336	31.1	222											99.9	742	7.42+
20	90	55	50	56	33	43	44.7	202	40.9	240	31.1	234	33.3	198	29.5	140							185.5	1014	5.47-
20	95	38	30	53	41	51	42.5	108	39.2	302	35.9	278											117.6	688	5.85 +
21	65	30	30	51	35	38	40.3	120	35.8	108	31.3	76											107.4	304	2.84-
21	80	40	40	52	39	44	42.0	168	39.3	170	36.6	154	33.9	144									151.6	636	4.19+
20	70	35	30	47	38	41	37.9	152	35.4	174	32.9	164											106.2	490	4.61 +
21	80	45	40	48	36	40	38.8	226	36.3	242	33.8	232	31.3	194									140.0	894	6.39-
21	65	35	30	50	36	40	39.7	260	36.8	260	33.9	178											107.4	698	6.49+
				Totals			523.4	2248	481.7	2792	433.9	2338	248.4	1546	100.3	462							1773.0	9186	
				Averages			4.29+		5.79+		5.38+		5.41+		4.60+										5.18+
23	95	80	80	57	20	23	45.6	162	41.7	186	37.8	146	33.9	136	30.0	82	26.1	106	22.2	72	18.3	80			
22	80	56	50	60	37	41	48.0	184	44.2	280	40.4	230	37.6	222	33.8	188									
22	90	55	50	56	38	42	45.2	200	42.2	222	39.2	184	36.2	202	33.2	146									
23	75	35	30	54	42	49	43.3	154	40.0	234	36.6	206													
23	80	50	50	53	33	37	42.5	122	39.2	154	39.2	230	35.9	170	32.6	160									
22	80	50	50	50	29	34	39.9	126	36.4	188	32.9	150	29.4	140	25.9	126									
23	70	40	40	55	38	44	44.1	68	40.5	178	36.9	158	33.3	174											
23	85	35	30	55	41	47	43.9	154	40.0	216	36.1	254													
22	75	45	30	60	54	60	49.2	100	47.5	306	45.8	262													
23	75	40	40	55	36	39	43.9	152	39.9	288	35.9	182	31.9	140											
22	70	28	20	54	47	51	43.5	186	41.3	252															
				Totals			489.1	1608	452.9	2504	380.8	2042	238.2	1184	155.5	702	26.1	106	22.2	72	18.3	80			
				Averages			3.29-		5.52+		5.36+		4.96+		4.51+		4.06		3.28+		4.37+				
24	85	45	40	61	42	46	48.9	164	44.9	218	40.9	164	36.9	154									171.6	700	4.07
25	70	35	30	66	50	54	52.8	188	48.3	246	43.8	272											144.9	706	4.87
25	75	50	50	58	37	41	46.6	176	43.1	278	39.6	240	36.1	190	32.6	172							198.0	105.6	5.33+
24	75	40	40	60	40	45	47.9	166	43.8	178	39.7	134	35.6	200									166.4	678	4.08-
25	75	48	20	57	37	43	45.4	86	41.3	210	37.2	230	33.1	226									156.8	752	4.74 -
24	80	40	40	60	40	46	47.9	176	43.8	224	39.7	108	35.6	172									166.6	760	4.56+
25	75	40	30	60	50	53	48.6	84	45.8	182	43.0	122											137.4	388	2.83+
				Totals			336.1	1040	311.0	1536	283.9	1270	141.7	942	32.6	172							1141.7	5040	
				Averages			3.07+		4.94-		4.47+		6664		5.27+										4.41+
27	75	45	40	69	44	51	54.9	164	49.7	230	44.5	242	39.3	188									188.4	824	4.37
26	90	58	50	61	48	48 ?	49.7	110	47.6	208	45.5	168	43.4	154	41.3	110							248.0	750	3.02 +
27	80	40	40	65	50	59	52.7	104	49.5	218	46.3	202	43.1	124									191.6	648	3.38
26	90	48	40	65	49	54	52.5	184	49.2	296	45.9	208	42.6	198									190.0	886	4.66+
26	85	55	50	64	39	44	51.2	160	47.1	182	43.0	166	38.9	206	34.8	154							214.5	868	4.05-
26	85	40	30	73	63	67	59.4	190	56.7	262	54.0	276											170.0	728	4.28+
				Totals			320.4	912	299.8	1396	279.2	1262	207.3	870	76.1	264							1204.25	4704	
				Averages			2.84+		4.65+		4.52-		4.19+		3.46+										3.91+
28	80	30	30	67	56	61	54.3	262	51.2	282	48.1	116											158.6	660	4.29
29	80	55	50	60	38	43	48.2	256	44.5	266	40.8	264	37.1	234	33.4	190							204.0	1210	5.73+
29	80	55	50	65	40	47	52.1	26	47.9	252	43.7	266	39.5	248	35.3	162							218.5	954	4.37-
28	75	46	40	72	45	52	57.2	210	51.6	244	45.0	346	38.4	274									194.4	1074	5.52+
28	85	70	70	67	18	20	52.9	190	47.1	222	41.3	180	35.5	184	29.7	128	23.9	118	18.1	94			247.8	1116	4.50+
				Totals			264.7	944	243.3	1266	244.1	1172	150.5	940	98.4	480	23.9	118	18.1	94			1014.7	5014	
				Averages			3.56+		5.20+		5.21+		6.24		4.89+		4.93+		5.19+						4.94+
31	95	48	40	76	59	65	61.6	158	58.2	278	54.6	206	51.0	192	46.1								225.0	834	3.26+
35	90	58	50	85	52	57	68.1	190	62.6	332	57.1	312	51.6	296	46.1	304							285.5	1434	5.02
36	85	50	50	77	59	65	62.7	90	59.7	228	56.7	218	53.7	198	50.7	190							283.5	924	3.26-
38	75	60	60	90	34	38	71.1	352	63.3	434	56.5	582	49.7	552	42.9	318	36.1	204					310.2	2442	7.87
43	105	40	30	100	83	98	81.0	150	76.3	858	71.6	562											228.6	1560	6.82+
46	100	60	60	100	59	67	80.5	106	74.8	348	69.1	274	63.4	282	57.7	264	52.0	256					397.2	1530	3.85+
				Totals			425.0	1046	394.9	2478	365.6	2186	269.4	1520	197.4	1076	90.1	460					1730	8724	
				Averages			2.46+		6.27+		5.97+		5.64+		5.45+		5.10 +								5.04+